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How Viable Is the UTAUT Model in a Non-Western Context?

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Abstract

The present research examines the plausibility of the Unified Theory of Acceptance and Use of Technology (UTAUT) model in predicting internet banking behaviour as a newly adopted technology in third world countries. Data is collected from three Arab countries: Jordan, Saudi Arabia and Egypt. Confirmatory factor analysis is used to test the hypothesized structural model. Findings are congruent with model testing under conditions of volitional usage behaviour. In this regard, the role of facilitating conditions variable is insignificant as a determinant of usage behaviour. Social norms variable also proved to be weak determinant of behavioural intentions. Findings demonstrate effort expectancy as the key determinant of internet banking usage behaviour in the examined markets, while users' experience moderates the impact of effort expectancy on behavioural intention. Results should enhance our understanding of internet banking usage in developing countries and support e-services promoting in this region.

Keywords: technology acceptance, UTAUT, Arab World, banking industry, online behavior

1. Introduction

The accelerating rate of growth in internet adoption in the Arab nations during the past decade has exceeded that of industrial nations (ITU, 2012). Banks in the Arab world are adjusting to technological progress and have introduced e-banking services to maintain their competitive edge. However, in order to take advantage of information technology, banks need to gain better understanding of the differences in consumers' perception and adoption of information technology applications. Differences in information technology usage and adoption are reported to be associated with cultural differences (Straub, 1994; Straub et al., 1997; Straub et al., 2001). The current study is conducted in three countries representative of three areas: Egypt (North Africa) Saudi Arabia (Gulf Region) and Jordan (Mediterranean) with an internet penetration rate of 44, 54 and 41 percent respectively (ITU, 2012).

Literature on technology acceptance comprises models that have been established and developed in the western world and there has been a general concern about the explanatory value of the technology acceptance models when applied to non-western countries (McCoy et al., 2007). Extant research on technology acceptance and usage has led to the formation of the Unified Theory of Acceptance and Use of Technology (UTAUT), a model considered to be a theoretical advance on its precursors and proved popular in the ten years since its inception (Venkatesh et al., 2003).

This paper aims to test the viability of the UTAUT in explaining online banking behaviour in non-western context. An added aim is to investigate whether previously established relationships from the Technology Acceptance Model (TAM) hold in the UTAUT model (Davis, 1989).

2. Research Background

The UTAUT is a robust model that provides a unified theoretical basis for technology adoption and diffusion investigations that has been adopted to explain use behaviour in a number of disciplines (Venkatesh et al., 2003). The model comprises four core variables: effort expectancy, performance expectancy, social influences and facilitating conditions. Age, voluntariness of use, experience and gender are expected to moderate the effects of

these core behavioral beliefs on behavioral intentions and system adoption (Figure 1) (Venkatesh et al., 2003).

2.1 Performance Expectancy

Performance Expectancy is the extent to which a user expects that a particular system might assist him/her to gain benefits. These benefits might relate to the overall performance of the job. This factor helps in predicting behavioral intentions in mandatory and optional utilization situations. Moreover, the relationship between performance expectancy and behavioral intention is expected to be moderated by gender and age; the relationship is more significant for men and older people (Venkatesh et al., 2003).

2.2 Efforts Expectancy

Efforts Expectancy is the extent to which a certain system offers convenience for usage. Interestingly, the ability of this construct to predict behavioral intentions is only valid during the initial phases of system adoption and that these effects tend to deteriorate over increased duration and consistent utilization (Taiwo & Downe, 2013). Likewise, the prediction ability is moderated by the factors of age and gender; these impacts would be dominant for females and older people.

2.3 Social Influences

Social Influences is the extent to which a person considers the beliefs of other people during the utilization of the system. The predictive ability of this construct is disintegrated under voluntary usage situations and manifest in mandatory usage. Similarly, females and older people are expected more to be influenced by the suggestions and thoughts of other people, mostly during initial phases of adoption; whereas, the impact tends to decline with experience (Venkatesh & Morris, 2000; Morris & Venkatesh, 2000).

2.4 Facilitating Conditions

Facilitating Conditions is the extent to which an individual feels comfortable to utilize a certain system that is supported by some infrastructures; these infrastructures mostly include technical and organizational infrastructure. Interestingly, this construct predicts behavioral intentions during the initial phases of system adoption and tends to decline with increased system knowledge. In addition, this construct overlaps with effort expectancy; if it is absent in the model, facilitating conditions are expected to be predictive of behavioral intentions (Taiwo & Downe, 2013). Further, facilitating conditions have a direct influence on usage behavior and such an effect would increase with experience gained. Moreover, older people would be more inclined to ask for support and assistance with new systems.

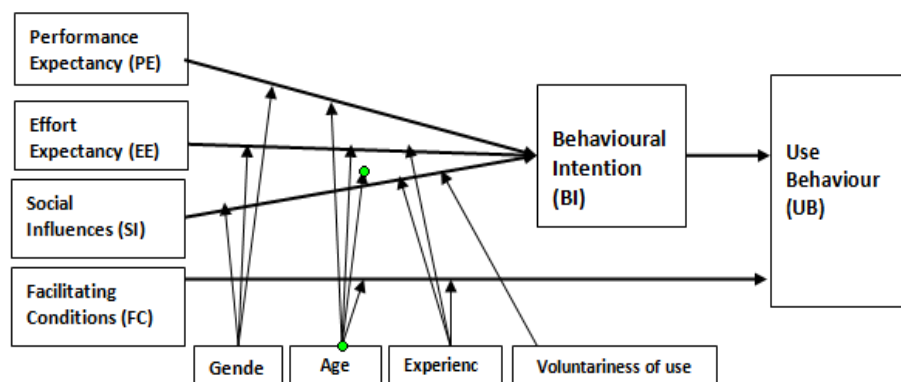


Figure 1. The unified theory of acceptance and use of technology (Venkatesh et al., 2003)

The UTAUT has its roots in Davis' (1989) Technology Acceptance Model (TAM) with its two main constructs. The first one is known as the PU or perceived usefulness, whereas, the second one is known as the PEOU or perceived ease of use. The social impacts and facilitating conditions are also rooted in another famous model, theory of planned behavior (Ajzen, 1985) and its decomposed version (Taylor & Todd, 1995), which also contributed to TAM extensions: TAM2 (Venkatesh & Davis, 2000) and TAM3 (Venkatesh & Bala, 2008). However, the interrelated links among PU-PEOU and social norm (equivalent to social influences) behavior intentions were not tested within the UTAUT; rather, caution was expressed by its authors as not to assume that the links prevail in the aggregated model. This paper attempts to investigate these links.

Since its inception, the UTAUT has undergone attempts at validation and extension. Oshlyansky validated this model over nine different countries in order to achieve cultural diversification. These samples comprised undergraduate and postgraduate students and the technology under investigation was website access in general. Although the study excluded two constructs from the model, behavioral intention and facilitating condition, three others were added: attitude, anxiety and self-efficacy as antecedents to usage behavior. The finding showed that the UTAUT is sufficiently robust to withstand translation and to be used cross-culturally. Another validation took place across the Middle East region (Lebanon, Iran, Iraq, Kuwait, Bahrain, Qatar, UAE, Oman, Saudi Arabia, Egypt, Sudan, and Djibouti) to investigate employees' disinclination to use a new project management system. In that instance, the finding reported non-support of all hypothesized model links (Jonsson, 2013).

A search of academic and scholarly databases (Ebsco, Emeralds, ProQuest, Science Direct and Google scholar) to locate papers that utilized this model to investigate behavioral intentions and utilization of different applications in the Middle East context resulted in thirteen papers (Table 1), which the present authors examined to uncover the trend and direction of the relationships reported within the model validation. One deduction that can be made is that the findings varied with respect to the strength of prediction for major constructs. The relations hypothesised between constructs in the original UTAUT model with respect to effort expectancy, social influences and facilitating conditions, are inconsistent. On the other hand, apart from one study, performance expectancy maintained its strength as the major predictor of behavioral intentions (Table 2). Performance expectancy has the strongest relationship with behavioral intentions while the impact of social influences on behavioral intentions tends to vary among users of different applications, and the impact of facilitating conditions on usage behaviour is also inconsistent (Dwivedi et al., 2001; Taiwo & Downe, 2013; Attuquayefio & Addo, 2014).

Table 1. Studies based on UTAUT in the Arab world

Authors/year	Context	Model	Statistics	Sample	location	Results
Mobile technology						
Alkhunaizan, & Love (2012)	Mobile commerce	Revised: adding cost & trust as antecedents to intention and dropping experience & voluntariness Age & gender treated as variables	Factor Analysis & Regression Analysis	Smart phone & users	Saudi Arabia	PE significantly predicts usage intentions followed by cost and EE Usage BI predict actual usage FC shows no significant influence on actual usage. Gender has no significant difference on usage while age has.
Al Otaibi, (2013)	Mobile Exchange	Modified: adding mobile exchange.	SEM	Mobile traders	Saudi Arabia	PE, EE, and SI predict BI towards use of mobile exchange (trading stock market), and this is moderated by age, gender, and education.
Alwahaishi & Snášel (2013)	Mobile Internet	Modified: adding Perceived Value, Perceived Playfulness, and Attention Focus as antecedents to intention	CFA- SEM	Experienced mobile internet- (students)	Saudi Arabia	PE, SI and FC significantly affect BI, which significantly impact ICT use.
e-Government						
Al Imarah et al. (2013)	e-services	Original model	CFA-SEM	Academic staff	Iraq	PE, EE, and FC contribute to the adoption of e-services and directly impact use behavior.
Al-Shafi & Weerakkody (2009)	e-services	Original model	Factor analysis & Logistic Regression	Citizens	Qatar	PE and SI good predictor of BI BI good predictor of e-government usage E-government users differ according to age, gender, and education.
Alshehri et al. (2013)	e-services	Amended model dropping use behavioral & voluntariness	CFA-SEM	Citizens	Saudi Arabia	PE, EE, and FC positively impact BI; however moderators (age and gender) have no impact. Internet experience moderates , EE-IB, SI-BI and FC-BI

<i>e- Learning</i>						
Jaradat & Banikhaled, (2013)	University Website e-services	Modified by adding website quality construct as antecedent to intention	Warp PLS 3.0	Undergrads	Jordan	PE and EE impact BI BI directly impact Experience impact WQ-IB and voluntariness impact SI-BI
Nassuora, (2012)	Mobile Learning	Modified by adding Attitude as antecedent to intention and dropping use behavior	EFA and Pearson Correlation	Undergrads	Saudi Arabia	PE and EE impact BI directly SI and FC impact BI indirectly through Attitude.
<i>Social Media Acceptance</i>						
Salim, (2012)	Face book	Modified by dropping use behavior	Pearson Correlation	Egyptian Face book users	Egypt	EE and SI significantly impact BI FC has a significant impact on BI moderated by age and experience
<i>Information Technology (IT)</i>						
Al-Gahtani et al. (2007)	Desktop Computer	Modified: dropping voluntariness, substituting SI with SN	PLS –Graph	Knowledge workers in 4 organizations	Saudi Arabia	PE - BI and moderated by age only SN-BI and moderated by experience and age only.
<i>e-Banking</i>						
Abu Shanab & Pearson (2007)	Internet Banking	Modified by dropping facilitating conditions and use behavior from the model.	Factor analysis & Multiple Regression	Internet banking users	Jordan	PE-IB moderated by gender and age EE-BI moderated by sex and age SI-IB significant moderated by gender and experience EE-IB and FC-IB not significant
AlMashaqba & Nassar (2012)	Mobile Banking	Modified by adding security, design issues, reliability as antecedent to intention and education as moderator while dropping other moderators	Factor analysis and KMO	Bank clients	Jordan	PE, SI only impact BI PE-BI and FC-Use is moderated by experience and education
AlQeisi & Al-Abdellah (2013)	Internet Banking	Extended by replacing FC with web quality design and dropping BI.	FCA- SEM	Internet banking users	Jordan	PE-usage directly and EE-usage indirectly through PE Web quality–usage behavior impact is higher than PE-usage SN- usage is non-significant

Table 2. Relationships amongst constructs in research carried out in Arab countries

	PE-BI	EE-BI	SI-BI	FC-BU	BI-BU
Abu Shanab & Pearson (2007)	sig	sig	sig	NA	NA
Al-Gahtani et al. (2007)	sig	non-sig	sig	non-sig	NA
Al Imarah et al. (2013)	sig	sig	non-sig	sig	sig
Al khunaizan & Love (2012)	sig	sig	sig	non- sig.	sig
Al Mashaqba & Nassar (2012)	sig	non-sig	sig	Sig	sig
Al Otaibi, B. (2013)	sig	sig	sig	NA	NA
Al-Qeisi & Al-Abdellah (2013)	NA	NA	NA	Sig	NA
Al-Shafi & Weerakkody (2009)	sig	non-sig	sig	non-sig	sig
Alshehri et al. (2013)	sig	sig	non-sig	NA	NA
Alwahaishi & Snášel (2013)	sig	non-sig	sig	Sig	sig
Jaradat & Banikhaled, (2013)	sig	sig	non-sig	non-sig	sig
Nassuora, (2012)	sig	sig	non-sig	non-sig	NA
Salim, B. (2012)	non- sig.	sig	sig	NA	NA

N/A: not applicable (not hypothesized).

This work replicates the original UTAUT study and explores determinants of internet banking usage behavior in three Middle Eastern countries, in addition to investigating the previously established relations among the equivalent constructs in the root models. However, voluntariness of use is not tested as a moderator in the model simply because; online banking is a voluntary choice by nature of service.

3. Method

3.1 The Sampling and Data Collection

Samples were extracted from the three markets using an online and offline questionnaire. The operational definition of the variable and scaling is based on the original study by the authors of the UTAUT model and adapted to internet banking usage behavior (Appendix 1). The research instrument was first converted into Arabic and then it was again converted into English. Preliminary tests were conducted for the instrument in different countries. In this regard, two commonly accepted techniques were used that includes pilot sampling and focus group. These techniques assisted in validating the meanings, comprehension and functionality according to the rules and desired time. Minor changes to wordings were applied in the three versions of the online survey. There were 776 usable surveys extracted from all markets. The samples demographics are presented in Table 3. Respondents are knowledgeable about computers and internet (63% and 75% ranged between good and very good) with 48% reporting more than 5 years of internet adoption and 27% more than two years for Internet banking usage. The demographics show that the samples are fairly young, with 70% aged between 26-46, and well- educated (55% undergraduates, 20% graduates and 10% postgraduate). Females comprised only 35% of the sample, while males predominated, with 65%. The majority (67%) reported personal motivation for internet banking usage, while work motivation amounted to 12% and dual motivation 21%. Most respondents report the high level of satisfaction with their online banking service providers (59% indicated a level of satisfaction above 4).

Table 3. Demographic profile of respondents

Respondent Profile	Category	Frequency	Percentage
Computer Knowledge	Poor	30	3.9
	Moderate	254	32.7
	Good	224	28.9
	Very good	268	34.5
Internet knowledge	Poor	20	2.6
	Moderate	174	22.4
	Good	299	38.5
	Very good	283	36.5
Internet experience	Less than one year	150	19.3
	1 -2 yrs	149	19.2
	3 – 4 yrs	108	13.9
	More than 5 yrs	369	47.6
Internet Banking usage	Less than six months	133	17.1
	6 - 12 months	132	29.9
	13 – 18 months	131	16.9
	19 – 24 months	67	8.6
	More than 24 months	213	27.4
Usage motivation	Personal	519	66.9
	Business	92	11.9
	Both	165	21.3

Level of satisfaction with current i-services	1	3	0.4
	2	17	2.2
	3	102	13.1
	4	195	25.1
	5	222	28.6
	6	153	19.7
	7	84	10.8
Age	25 yrs and less	166	21.4
	26 – 35 yrs	361	46.5
	36 - 46 yrs	183	23.6
	47 – 57 yrs	51	6.6
	58 yrs and more	15	1.9
Education	High school and below	85	11.0
	Bachelor	424	54.6
	Masters	157	20.2
	Doctorate	81	10.4
	other	29	3.6
Gender	Male	506	65.2
	Female	270	34.8

Data was initially screened and treated for missing data, using estimation, before being combined and treated for multivariate normality based on Byrne's guidelines (Byrne, 2010, pp. 104-106). The data was tested as a single set to evaluate how the model performs on a diverse and mixed sample. The sample size after treatment was 677. Confirmatory factor analysis indicated that facilitating conditions construct and two social influence items are candidates for elimination. The fit measures satisfy the standard criteria: $\chi^2 = 142.9$, $df = 55$, $\chi^2/df = 2.60$, CFI = .990, GFI = 0.971, RMSEA = 0.047.

Convergent validity measured by reliability, variance and factor loadings is presented in Table 4. The Average variance extracted (AVE) values are greater than the squared correlations among variable indicating an acceptable discriminant validity Average variance extracted (AVE) values are greater than the squared correlations between constructs (Table 5), indicating acceptable discriminant validity (Hair et al., 2006).

Table 4. Standardized factor loadings, variances extracted, and reliability estimates

	PE	EE	SI	BI	USE
PE1	.842				
PE2	.939				
PE3	.882				
EE2		.820			
EE3		.885			
EE4		.844			
SI1			.893		
SI2			.875		
BI1				.904	
BI2				.950	
BI3				.939	
USE1					.795
USE2					.882
AVE	.790	.723	.782	.867	.705
Reliability	.916	.884	$r^2 = .887$.951	$r^2 = .824$

Table 5. Squared correlation matrix

	USE	BI	SI	PE	EE
USE	.705				
BI	.684	.867			
SI	.354	.243	.782		
PE	.637	.630	.288	.790	
EE	.678	.664	.323	.697	.723

Note. Average variances extracted are on the diagonal. The values below the diagonal are the relations between various constructs that are squared.

3.2 Structural Model

The structural model comprised only three behavior determinants: performance expectancy, social influences and effort expectancy. The hypothesized paths in the original UTAUT model (Table 6) and regression weights indicate that all three constructs impact behavioral intentions significantly; however social influences has the lowest impact. In addition, the model fit readings were not acceptable, which calls for the elimination of social influences in order to improve model fit indices.

Table 6. Path estimate for the original model

Path	Estimate	Standard Error	t
BI <--- PE	.501	.043	11.601***
BI <--- EE	.537	.045	11.848***
BI <--- SI	.063	.028	2.255*
USE <--- BI	.838	.036	22.983***

Note. * = $p < 0.05$; *** = $p < 0.001$.

The final structural model comprised only the two behavioral determinants: performance expectancy and effort expectancy; with the latter having higher impact on behavioral intentions (a standardized regression weight is .568 vs. .536 and standardized total effect is .479 vs. .453).

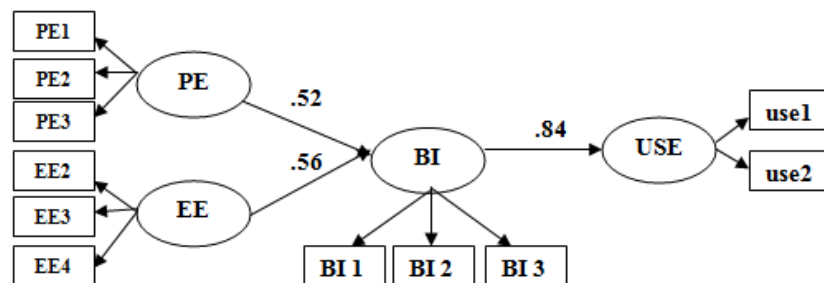


Figure 2. The final structural model

The structural model with two behavioral beliefs explained 84 percent of use behavior, a percentage that is higher than acquired by the original UTAUT model (70%).

3.3 The Mediating Effect of PE

The original UTAUT study does not test previously established relationships among the TAM constructs and the mediating role of performance expectancy (equal to PU) between effort expectancy (equal to PEOU) and behavioral intentions (Venkatesh et al., 2003). Nevertheless, other research does report these links (Al-Qeisi &

Al-Abdellah, 2003; Al-Qeisi et al., 2014). These links are confirmed statistically in this current study. As Figure 3 illustrates, the standardized regression coefficient between Performance Expectancy and Effort Expectancy is statistically significant, as is the standardized regression coefficient between Performance Expectancy and Behavioral Intentions. The standardized indirect effect was (.313). Using bias-corrected bootstrap at 95% confidence intervals, significance of this indirect effect is tested (Cheung & Lau, 2008); the bootstrapped unstandardized indirect effect is .357, and the 95% confidence interval ranges from .240, .481, hence, the indirect effect is statistically significant ($p = 0.001$) implying partial mediation.

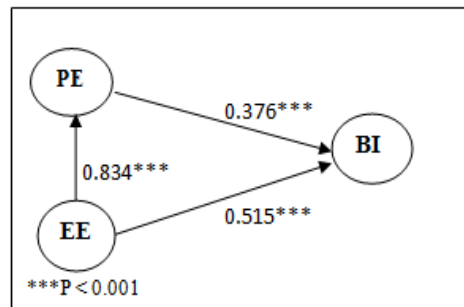


Figure 3. The mediation role of PE

Adding the path EE-PE resulted in improved path estimates. However, the impact of effort expectancy on behavioral intentions is still higher than performance expectancy's impact (Table 7). The model fit also improved; the fit measures satisfy the standard criteria: $\chi^2 = 179.4$, $df = 40$, $\chi^2 / df = 4.49$, CFI = 0.982, GFI = 0.957, RMSEA = 0.060.

Table 7. Path estimations for hypothesized model

Path	Estimate	Standard Error	t
BI <--- PE	.428	.059	7.3***
BI <--- EE	.587	.061	9.7***
PE <--- EE	.835	.038	22.2***
USE <--- BI	.837	.036	23.0***

Note. *** = $p < 0.001$.

3.4 Impact of Moderators

Before testing for moderation, measurement invariance is established: the degree to which various items possess significance across different categories that are similar (French & Finch, 2006). All group models were tested separately and based on satisfactory data fit indices, multi-group analysis was run in IBM SPSS Amos and all groups were invariant $\Delta CFI < .01$ (Byrne et al., 2007) (Table 8).

3.5 Effort Expectancy – Performance Expectancy (EE–PE)

The regression weight estimates demonstrate that perceptions of lower-effort internet banking system impact system's performance expectancy in a way that is higher for males than females (.828 vs. .807); for the older age group than the younger age group (.876 vs. .762); and for highly computer and internet experienced individuals than moderately experienced individuals (.815 vs. .727). However, for all these groups EE-PE path coefficients differences are non-significant (t value < 2). The amount of variance accounted for in performance expectancy by effort expectancy (Table 9) is higher for women than for men (.751 vs. .656); for older age group than younger group (.772 vs. .619) and for moderately experienced individuals than for highly experienced (.719 vs. .641).

3.6 Performance Expectancy – Behavioral Intentions (PE–BI)

Based on the regression weight estimates of multi-group analysis, the impact of performance expectancy on

behavioral intentions is higher for males than females (.459 vs. .348), for younger age group than older age group (.518 vs. .434) and for high experience group than moderate experience group (.470 vs. .161). However, all groups PE-BI path coefficients differences are non-significant (t value $< \pm 2$).

3.7 Effort Expectancy – Behavioral Intentions (EE–BI)

Effort expectancy is a greater direct determinant of behavioral intentions for females compared to males based on the regression weights output (.674 vs. .542). The impact is slightly different between the two age groups (.579 vs. .523); however, the impact is more profound for moderately experienced individuals compared to highly experienced individuals (.828 vs. .502). The path coefficient is also higher for moderate experience group compared to high experience group (.773 vs. .442) and in this case the difference is significantly different (t value = 2.076).

3.8 Behavioral Intentions – Use Behavior (BI–USE)

Behavioral intentions determine use behavior similarly for both genders (.808 and .860) but slightly higher for old people against the youngsters (.977 vs. .879) and for highly experienced individuals compared to moderately experienced (.857 vs. .769). However, these path coefficients differences are non-significant (t value < 2). The amount of variance accounted for in use behavior by behavioral intentions is a little higher for males than females, for moderately experienced group compared to highly experience group (Table 9).

Table 8. AMOS output for moderates statistics

Overall multi-group model fit indices		Multi-group analysis statistics	CFI	ACFI	Paths	Group 1				Group 2				
Gender						M. R.W	S.E	t	S.R.W	F. R.W	S.E	t	S.R.W	t-diff.
$\chi^2 = 228.7$, df= 80	Unconstrained	.981			EE -PE	.828	.048	17.17	.810	.807	.059	13.71	.867	0.276
$\chi^2/\text{df} = 2.86$	Measurement weights	.981	.000		PE - BI	.459	.069	6.61	.406	.348	.116	3.01	.294	0.822
GFI = 0.947	Structural Weights	.981	.000		EE - BI	.542	.073	7.44	.469	.674	.112	6.03	.613	-0.987
CFI = 0.981					BI - USE	.808	.045	17.85	.890	.860	.062	13.87	.870	-0.678
RMSEA = 0.051														
Age						Age1 R.W	S.E	t	S.R.W	Age2 R.W	S.E	t	S.R.W	t-diff.
$\chi^2 = 172.4$, df = 78	Unconstrained	.981			EE -PE	.762	.097	7.83	.787	.876	.053	16.56	.879	-0.226
$\chi^2/\text{df} = 2.210$	Measurement weights	.983	.002		PE - BI	.518	.129	4.01	.446	.434	.096	4.53	.377	0.447
GFI = 0.937	Structural Weights	.983	.002		EE - BI	.523	.126	4.15	.465	.579	.098	5.93	.505	0.363
CFI = 0.981					BI - USE	.879	.121	7.25	.994	.977	.060	16.37	.989	-0.851
RMSEA = 0.050														
Exp.						M R.W	S.E	t	S.R.W	H R.W	S.E	t	S.R.W	t-diff.
$\chi^2 = 246.1$, df= 80	Unconstrained	.977			EE -PE	.727	.074	9.82	.848	.815	.046	17.68	.801	-1.009
$\chi^2/\text{df} = 3.07$	Measurement weights	.976	.001		PE -BI	.161	.151	1.06	.129	.470	.064	7.31	.422	-1.884
GFI = 0.942	Structural Weights	.976	.001		EE -BI	.828	.142	5.81	.773	.502	.067	7.48	.442	2.076
CFI = 0.977					BI -USE	.769	.085	9.06	.886	.857	.044	19.48	.854	-0.919
RMSEA= 0.054														

Note. R.W. = regression weights; S.E. = standard error of the regression weights; S.R.W. = standardized regression weights; t = t -value of the regression coefficient (critical ratio); t -diff. = t -value of the difference between Groups 1 and 2; Gender M = Males; F= Females; age 1 = 26- <35; age 2 = 35 - <46 years; Exp. = experience; M = moderate; H = high.

Table 9. Groups estimates of variance explained (squared multiple correlations)

Variable	Males	Females	Age1	Ag2	Moderate experience	High experience
PE	.656	.751	.619	.772	.719	.641
BI	.692	.775	.742	.733	.783	.671
USE	.792	.757	.678	.726	.785	.729

3.9 Differences between Country Samples

Using the final structural model (Figure 2) as the baseline model, multiple-group analysis is run between the three country samples. Table 10 reports the model fit indices for the three samples. Egyptian and Jordanian samples have an acceptable model fit whereas the Saudi sample is out of range on most of the fit statistics.

Table 10. Model fit indices for country samples

	χ^2	df	χ^2/df	GFI	CFI	RMSEA
Egypt	102.943	40	2.574	0.945	0.979	0.069
Jordan	79.591	40	1.990	0.942	0.985	0.067
Saudi Arabia	121.326	40	3.033	0.890	0.954	0.108

The Jordan and Egypt samples are checked for invariance using multi-group analysis. The samples model fit indices are acceptable: $\chi^2=182.5$ $df = 80$ and $\chi^2/df = 2.28$; GFI= 0.944; CFI= 0.982; RMSEA= 0.048. Running the invariance analysis showed that path PE-IB is non-significant for the Egyptian sample. All other paths are significant as reported in Table 11. In addition, the ΔCFI values support the invariance assessment of the multi-groups (all values <.01).

Table 11. Non standardized path estimates for country groups

Path	Egypt				Jordan				t-diff. Egypt-Jordan
	R.W	S.E	t	S.R.W	R.W	S.E	t	S.R.W	
EE - PE	.792	0.057	14.003	.897	.793	0.067	11.755	.778	-0.01137
PE - BI	.214	.153	1.397	.168	.349	0.094	3.725	.305	-0.7518
EE - BI	.844	.143	5.908	.750	.622	0.099	6.248	.534	1.27641
BI - USE	.911	0.057	16.071	.950	.838	0.058	14.377	.867	0.897684

Note. R.W. (regression weights) S.R.W. (standardized regression weights).

The standardized regression weights showed that effort expectancy has the highest impact on behavioral intentions for both samples, and that impact is almost identical. However, the hypothesized path PE-BI was not significant for Egypt. It seems that the internet banking users in Egypt are motivated by effort expectancy, ease of use, more than system performance and efficiency. All path coefficients are non-significant (t-values <2) between the two country groups.

The Saudi sample modification indices suggested a direct path from effort expectancy to usage behavior. Adding such path is acceptable and has a basis in the literature (Venkatesh, 1999; Davis et al., 1989; Venkatesh & Morris, 2000; Agarwal & Prasad, 1999). Adding this path also improves the model fit readings: $\chi^2 = 90.462$, $df = 40$ and $\chi^2/df = 2.312$, GFI = 0.912, CFI = 0.970, and RMSEA= 0.081. The standardized regression weight for the path EE-USE weights is close to that of BI-USE (.472 and .473 respectively). However, the standardized total effect shown in Table 12 demonstrates that the effort expectancy has the highest impact on use behavior, both direct and indirect through performance expectancy, followed by behavioral intentions.

Table 12. Standardized total effect

	EE	PE	BI	USE
PE	.766	.000	.000	.000
BI	.593	.775	.000	.000
USE	.767	.377	.486	.000

4. Discussion

This work examines the viability of the aggregated technology acceptance model in non-western cultures within an online context. The results reveal that the UTAUT is applicable in explaining online behavior in non-western cultures under discretionary use limitations. In particular, importance of the facilitating conditions did not materialize given that participants are actual users of the internet banking system and the existence of effort expectancy in the model, which according to the UTAUT authors, overlaps with facilitating conditions and lead to weakening effect of the latter (Venkatesh et al., 2003). The effects of social influences on behavioral intentions were also weak which is consistent with technology acceptance research attributing such findings to the moderating effect of experience and voluntariness (Karahanna et al., 1999). Moreover, such unimportant effects of social influences on behavioral intentions within the UTAUT context are also reported findings under different web-based technology applications: for example e-government services and e-learning (Alshehri et al., 2013; Al Imarah et al., 2013; Jaradat & Banikhaled, 2013; Nassuora, 2012).

Once these two constructs are eliminated from the model, the behavioral beliefs effort expectancy and performance expectancy accounted for much of the differences in the behavioral intention construct. The findings point to effort expectancy as the key determinant of behavioral intentions in the three samples, which disconfirms the original UTAUT model where performance expectancy is purported to represent the key determinant of use behavior through behavioral intention. However, literature reports that the only context in which the influence of effort expectancy on behavioral intentions is crucial in internet applications (King and He, 2006). This finding implies that Arab internet banking users' decisions on technology adoption are influenced significantly by the ease of use that technology offers, in line with other previous research in the Arab world. For example, Jaradat & Banikhalid found effort expectancy to have the strongest effect on behavioral intentions among students in Jordan using a university website (Jaradat & Banikhalid, 2009). Nassuora finds effort expectancy to be more predictive of behavior intention among Saudi students within mobile learning context (Nassuora, 2012). One explanation for such a powerful impact of effort expectancy as compared to performance expectancy might lie in the fact that internet banking services are still in their introductory stage in these countries and the numbers of services/tasks that can be executed are still rather basic (i.e. 80% of current respondents use the online access for basic services such as enquiring about balances, accessing accounts, transferring money between accounts and paying utility bills). Abbad et al. (2012) reports similar findings.

The impact of performance expectancy on behavioral intention is unimportant in the Egyptian model. This finding implies that Egyptians are more motivated by system low-effort expectancy than performance expectancy, in accordance with previous studies (El- Kasheir et al., 2009; Salim, 2012). El- Kasheir reports bank clients may be drawn to the online services at first by its performance efficiency but with habit, repeated use and gained experience, the ease of use may become the salient factor (El- Kasheir, et al., 2009). Furthermore, TAM research across cultures indicates that the PEOU is the salient determining factor of usage in Arab developing countries (Elbeltagi et al., 2005; Rouibah, 2008; Khushman et al., 2010).

A contribution of this work is testing the partial mediating role of performance expectancy between effort expectancy and behavioral intentions. In the original model, the two behavioral beliefs are not related, and each uniquely explains a level of variance in use behavior through behavioral intentions. Contrariwise, this current study demonstrates that the mediation role of performance expectancy connects the two beliefs amplifying user perceptions of system effort expectancy (ease of use) as a window to assess system efficiency (task completion at minimal effort) and building perceptions of channel usefulness.

The impact of moderators on the model structure was invariant among gender groups, age and experience. However, paths regression weights showed small differences among groups. Males' perceptions of effort expectancy influence perceptions of performance expectancy slightly higher than females; also males' perceptions of system performance expectancy impact their behavioral intentions more than females whereas females' behavioral intentions are more induced by system effort expectancy. However, both genders are closely

similar with respect to behavioral intentions impact on use behavior.

Age differences among respondents suggest that mature users' behavioral intentions may be motivated by system effort expectancy more than the younger group and their intentions may have a slightly higher impact on actual use behavior whereas the younger group behavioral intentions may be more driven by system performance expectancy. However, these differences are non-significant.

Experience has the only significant moderating effect on the path effort expectancy-behavioral intentions that medium experienced internet banking users are more motivated by system low-effort than high experienced users. On the other hand, high experienced users may be more motivated by system usefulness or performance expectancy although that difference is non-significant.

4.1 Implications for Practice

The findings suggest that online banking is still in its infancy stage in the Arab countries studied, the inference that respondents are using the online channel access to perform basic tasks means that the service has not matured sufficiently to replace the traditional channels fully. Practitioners' may encourage people to use more electronic services by increasing the value perceptions through means such as taking no fees or charges or offering more benefits such as convenience and confidentiality. The findings also reveal that effort expectancy is the main determinant of behavioral intentions and behavioral use. This implies that people are drawn to an online service motivated by the ease of use, implying the existence of a user-friendly website interface. Although moderators had no real impact on the model, the level of computer and internet experience differences imply that with spread use of e-services, experienced users are drawn by the e-banking efficiency characteristics. Additionally, the majority of users are young people aged 25-35, the active online generation in Arab countries (IUT reports, 2013), which indicates the need for more focused attention to the requirement of this generation (e.g. extending more credit facilities in view of increased interest in e-commerce amongst young shoppers).

5. Limitations of the Study

As with any study, limitations need to be considered in the interpretation of the results. First, the study is a cross-sectional research and results need to be confirmed using a longitudinal study. Further longitudinal studies may offer insights into how usage determinants change overtime. Second, the samples were not parallel in size after treatment to meet multivariate normality, the result produced imbalanced sizes. Saudi sample size (196) was smaller compared to Jordan's (221) and the (260) of Egypt; hence, the findings of the Saudi sample should be confirmed through a larger sample. Third, the results are restricted to internet banking users in the three Arab countries, consequently, due to cultural and technological factors; the results may not be confirmed when examining other e-banking channels in other Arab countries. As a general rule, in order to verify the research results, the research should be expanded geographically and to other banking choices as well, e.g. mobile banking. Fourth, the present study investigated the internet banking behavior as a means to examine the viability of the UTAUT model in non-western context. This means that the behavior examined was entirely centered on the salient beliefs as the UTAUT model suggests. The model, however, does not take into consideration other factors that may inhibit the online banking behavior such as online security, pricing, elements of web design. Finally, the variables of the model were measures using self-report design, which means that the results may be influenced by common method bias or social desirability tendency that might have distorted the mean for samples information.

6. Conclusion

This study compared users' adoption behavior of internet banking in the non-western context in particular Arab countries by applying the UTAUT model (Venkatesh et al., 2003). The model fits under condition of voluntary use behavior and experienced users, provides evidence of technology globalization; while differences between western and non-western countries in terms of the impact effort expectancy indicates the continuance existence of some cultural differences. Furthermore, performance expectancy is not a significant influence on behavioral intentions in Egypt consistent with previous studies; hence effort expectancy possesses a noteworthy significance as it affects both behavioral intentions/usage and performance expectancy which justifies attention to cultural differences. In context of further studies, it is necessary to examine the model viability using a larger sample to confirm the research findings. It would also be interesting to investigate further the model viability in other geographical areas within the Arab world (e.g. Arab Maghreb or West North Africa). Moreover, in order to increase the explanatory power of the UTAUT model additional factors should be considered (i.e. bank website aspects of privacy and interactivity). There is also a need to develop further direct measures to increase accuracy and validity of the conceptual model and minimize bias and social desirability tendency among respondents. Finally, with the evolution of new applications, this research can be applied using other e-service options.

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Appendix 1

Variable	Definition	Operational Definition
Performance Expectancy	The degree to which an individual believes that using internet banking will help him/her attain gains in performing banking tasks through this channel.	PE1: I find internet banking useful
		PE2: Using internet banking enables me to accomplish banking tasks more quickly
		PE3: Using internet banking increases the effective use of my time in handling my banking tasks
		PE4: Using internet banking increases the quality of my banking services output at minimal efforts.
Effort Expectancy	The degree of ease associated with the use of internet banking.	EE1: My interaction with internet banking is clear and understandable
		EE2: I am skilful at using internet banking
		EE3: Learning to use the internet banking system is easy for me
		EE4: I find it easy to get the internet banking system to do what I want it to do
Social Influences	The degree to which an individual perceives that important others believe he/she should use internet banking and also measures bank staff support in usage of the internet channel.	SI1: People who are important to me think that I should use internet banking facilities
		SI2: People who influence my behavior think I should use internet banking.
		SI3: The bank staffs are helpful in the use of the internet banking system.
		SI4: The branch encourages the use of internet channel
Facilitating Conditions	The degree to which an individual believes that the bank and technical infrastructure exists to support use of the online access system.	FC1: I have the resources necessary to use the system at the branch
		FC2: I have the knowledge necessary to use the system
		FC3: The system is not compatible with other systems I use.
		FC4: A specific person (or group) is available for assistance with system difficulties
Behavioral Intentions		BI1: I intend to continue use IB services
		BI2: I predict I would use IB services in the future
		BI3: I plan to use IB services to improve the outcomes
Usage Behavior	Actual use of the system	UB1: I consider myself a regular user of IB services
		UB2: I prefer to use IB services when available
		UB3: I do most banking task online
		UB4: My tendency is towards using IB services whenever possible

Source: Venkatesh et al. (2003) with adaptation to internet banking usage behaviour.

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